

## PAR<sup>®</sup> Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-204AC (DO-15)

PRIMARY CHARACTERISTICS	
$V_{WM}$	5.5 V to 36.8 V
$V_{BR}$	6.8 V to 43 V
$P_{PPM}$	600 W
$P_D$	5.0 W
$I_{FSM}$	75 A
$T_J$ max.	185 °C
Polarity	Uni-directional
Package	DO-204AC (DO-15)

### TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, automotive, and telecommunication.

### FEATURES

- Junction passivation optimized design passivated anisotropic rectifier technology
- $T_J = 185$  °C capability suitable for high reliability and automotive requirement
- Available in uni-directional polarity only
- 600 W peak pulse power capability with a 10/1000  $\mu$ s waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

### MECHANICAL DATA

**Case:** DO-204AC, molded epoxy over passivated junction Molding compound meets UL 94 V-0 flammability rating Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation with a 10/1000 $\mu$ s waveform <sup>(1)</sup> (fig. 1)	$P_{PPM}$	600	W
Pulse current with a 10/1000 $\mu$ s waveform <sup>(1)</sup> (fig. 3)	$I_{PPM}$	See next table	A
Power dissipation on infinite heatsink at $T_L = 75$ °C (fig. 5)	$P_D$	5.0	W
Peak forward surge current 8.3 ms single half sine-wave <sup>(2)</sup>	$I_{FSM}$	75	A
Maximum instantaneous forward voltage at 50 A <sup>(2)</sup>	$V_F$	3.5	V
Operating junction and storage temperature range	$T_J, T_{STG}$	-65 to +185	°C

### Notes

<sup>(1)</sup> Non-repetitive current pulse, per fig. 3 and derated above  $T_A = 25$  °C per fig. 2

<sup>(2)</sup> Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 per minute maximum



ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)									
DEVICE TYPE	BREAKDOWN VOLTAGE $V_{BR}$ <sup>(1)</sup> AT $I_T$ (V)		TEST CURRENT $I_T$ (mA)	STAND-OFF VOLTAGE $V_{WM}$ (V)	MAXIMUM REVERSE LEAKAGE AT $V_{WM}$ $I_D$ ( $\mu\text{A}$ )	$T_J = 150\text{ }^\circ\text{C}$ MAXIMUM REVERSE LEAKAGE AT $V_{WM}$ $I_D$ ( $\mu\text{A}$ )	PEAK PULSE CURRENT $I_{PPM}$ <sup>(2)</sup> (A)	MAXIMUM CLAMPING VOLTAGE AT $I_{PPM}$ $V_C$ (V)	MAXIMUM TEMP. COEFFICIENT OF $V_{BR}$ ( $\%/^\circ\text{C}$ )
	MIN.	MAX.							
P6KA6.8	6.12	7.48	10	5.50	500	1000	55.6	10.8	0.057
P6KA6.8A	6.45	7.14	10	5.80	500	1000	57.1	10.5	0.057
P6KA7.5	6.75	8.25	10	6.05	250	500	51.3	11.7	0.061
P6KA7.5A	7.13	7.88	10	6.40	250	500	53.1	11.3	0.061
P6KA8.2	7.38	9.02	10	6.63	100	200	48.0	12.5	0.065
P6KA8.2A	7.79	8.61	10	7.02	100	200	49.6	12.1	0.065
P6KA9.1	8.19	10.0	1.0	7.37	25	50	43.5	13.8	0.068
P6KA9.1A	8.65	9.55	1.0	7.78	25	50	44.8	13.4	0.068
P6KA10	9.00	11.0	1.0	8.10	10	20	40.0	15.0	0.073
P6KA10A	9.50	10.5	1.0	8.55	10	20	41.4	14.5	0.073
P6KA11	9.90	12.1	1.0	8.92	5.0	5.0	37.0	16.2	0.075
P6KA11A	10.5	11.6	1.0	9.40	5.0	5.0	38.5	15.6	0.076
P6KA12	10.8	13.2	1.0	9.72	2.0	5.0	34.7	17.3	0.076
P6KA12A	11.4	12.6	1.0	10.2	2.0	5.0	35.9	16.7	0.078
P6KA13	11.7	14.3	1.0	10.5	2.0	5.0	31.6	19.0	0.081
P6KA13A	12.4	13.7	1.0	11.1	2.0	5.0	33.0	18.2	0.081
P6KA15	13.5	16.3	1.0	12.1	1.0	5.0	27.3	22.0	0.084
P6KA15A	14.3	15.8	1.0	12.8	1.0	5.0	28.3	21.2	0.084
P6KA16	14.4	17.6	1.0	12.9	1.0	5.0	25.5	23.5	0.086
P6KA16A	15.2	16.8	1.0	13.6	1.0	5.0	26.7	22.5	0.080
P6KA18	16.2	19.8	1.0	14.5	1.0	5.0	22.6	26.5	0.088
P6KA18A	17.1	18.9	1.0	15.3	1.0	5.0	23.8	25.2	0.088
P6KA20	18.0	22.0	1.0	16.2	1.0	5.0	20.6	29.1	0.090
P6KA20A	19.0	21.0	1.0	17.1	1.0	5.0	21.7	27.7	0.090
P6KA22	19.8	24.2	1.0	17.8	1.0	5.0	18.8	31.9	0.092
P6KA22A	20.9	23.1	1.0	18.8	1.0	5.0	19.6	30.6	0.092
P6KA24	21.6	26.4	1.0	19.4	1.0	5.0	17.3	34.7	0.094
P6KA24A	22.8	25.2	1.0	20.5	1.0	5.0	18.1	33.6	0.094
P6KA27	24.3	29.7	1.0	21.8	1.0	5.0	15.3	39.1	0.096
P6KA27A	25.7	28.4	1.0	23.1	1.0	5.0	16.0	37.5	0.096
P6KA30	27.0	33.0	1.0	24.3	1.0	5.0	13.8	43.5	0.097
P6KA30A	28.5	31.5	1.0	25.6	1.0	5.0	14.5	41.4	0.097
P6KA33	29.7	36.3	1.0	26.8	1.0	5.0	12.6	47.7	0.098
P6KA33A	31.4	34.7	1.0	28.2	1.0	5.0	13.1	45.7	0.098
P6KA36	32.4	39.6	1.0	29.1	1.0	5.0	11.5	52.0	0.099
P6KA36A	34.2	37.8	1.0	30.8	1.0	5.0	12.0	49.9	0.099
P6KA39	35.1	42.9	1.0	31.6	1.0	5.0	10.6	56.4	0.100
P6KA39A	37.1	41.0	1.0	33.3	1.0	5.0	11.1	53.9	0.100
P6KA43	38.7	47.3	1.0	34.8	1.0	5.0	9.7	61.9	0.101
P6KA43A	40.9	45.2	1.0	36.8	1.0	5.0	10.1	59.3	0.101

**Notes**

- (1) Pulse test:  $t_p \leq 50\text{ ms}$   
(2) Surge current waveform per fig. 3 and derate per fig. 2  
(3) All terms and symbols are consistent with ANSI/IEEE C62.35



ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
P6KA6.8AHE3/54 <sup>(1)</sup>	0.415	54	4000	13" diameter paper tape and reel

**Note**

<sup>(1)</sup> AEC-Q101 qualified

**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

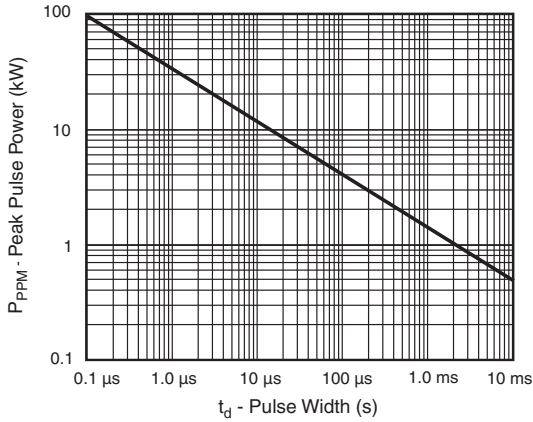


Fig. 1 - Peak Pulse Power Rating Curve

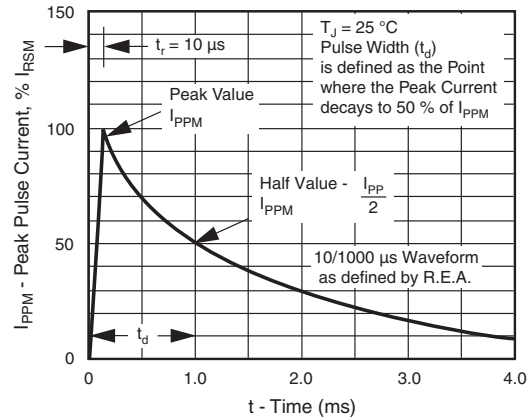


Fig. 3 - Pulse Waveform

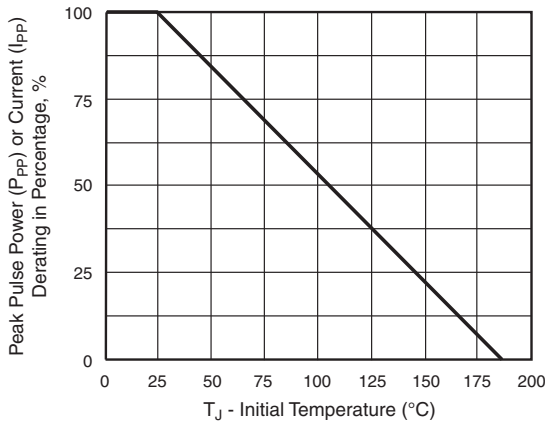


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

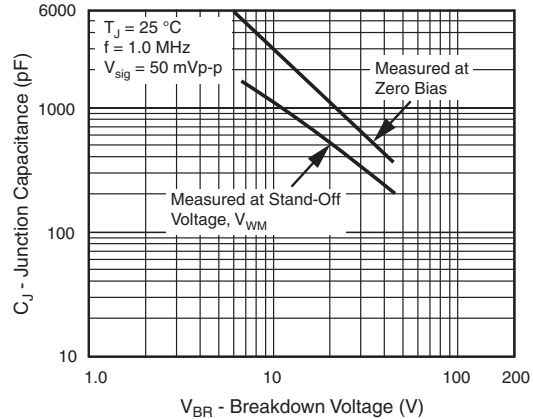


Fig. 4 - Typical Junction Capacitance

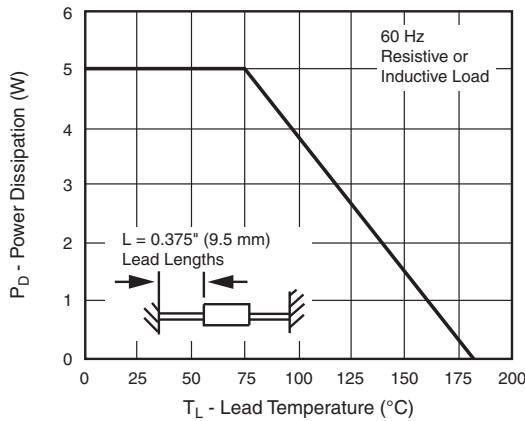


Fig. 5 - Power Derating Curve

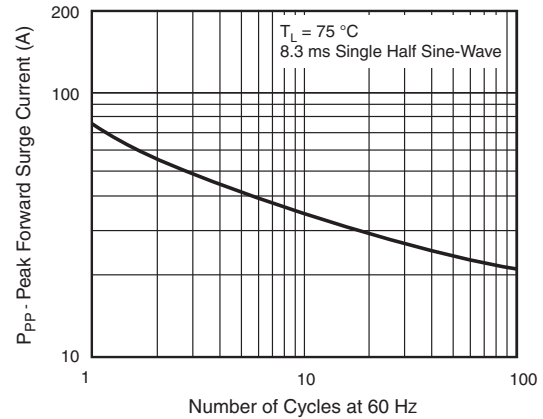
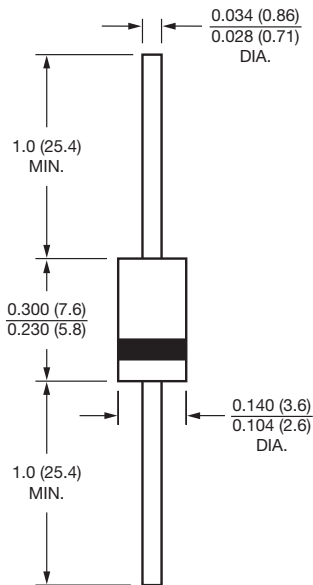


Fig. 6 - Maximum Non-Repetitive Forward Surge Current

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**DO-204AC (DO-15)**





## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.